

SDEV1201

Database Fundamentals

LESSON 14

Let's review

Data Manipulation Language

DML stands for Data Manipulation Language. Tables and formulas are helpful when communicating with data stored up to a point in a database through SQL (Structured Query Language), but a time comes when we actually want to execute some fairly complicated data interactions. We will also need the Data Manipulation Language in that situation. DML is a way to inform a database precisely what we want it to do by conversing in a manner that it has been built to comprehend from scratch. When it comes to interacting with existing data, whether adding, moving, or deleting data, it provides a convenient way to do so.

Data Manipulation Language

Generally, DML commands fall into one of three primary categories:

- INSERT adds fresh data to a table.
- UPDATE Change the data that is already in a table.
- DELETE takes a record out of a table.

The INSERT Statement

The INSERT statement adds 1+ rows to a table.

```
INSERT [INTO] TableName (column1, column2, ...)  
VALUES (value1, value2, ... )
```

Values can be hardcoded values, expressions, DEFAULT, NULL, or even a subquery.

Alternatively, we can INSERT data from another table: we use the results of a SELECT query as the values to INSERT.

```
INSERT [INTO] TableName (column1, column2, ...)  
SELECT ...
```

The **INSERT** Statement

If an Insert statement supplies data that does not comply with the constraints defined for a column or supplies data that is incompatible with the data type of the column the Insert fails and an error message is issued by SQL Server.

In general, there are three ways to do an insert:

1. Select data from another table (e.g. a backup table).
2. Hard code the data values in the INSERT statement itself.
3. A combination of methods 1 and 2.

Example

Insert Into Staff

(StaffID, FirstName, LastName, DateHired, DateReleased, PositionID, LoginID)

Values

(25, 'Alex', 'Code', '2024-10-01', Null, 4, 'acode');

Note:

- The list of values is in the same order as the column list
- The keyword null is used to insert a value of null in DateReleased column.

Update

The Update statement is used to update existing data in a table. It can be used to update one or more columns. Data can be updated by providing new values for columns or by using subqueries to provide the new data.

Update

Simplified Syntax:

```
UPDATE table_name
SET column = expression [ , column = expression . . . ]
[FROM table_name1 [, table_name2 ...] ]
[WHERE expression];
```

table_name - identifies the table to be updated

SET - identifies the column(s) to be updated and the expression which provides the new value for the column. The expression can be a subquery.

FROM clause - optional

- identifies additional table(s) referenced in the where clause that lets you update rows in a table based on data in one or more other tables. If more than one table is included, tables are comma-delimited

WHERE clause - optional. Identifies what records are to be updated. if the FROM clause is utilized, table join condition(s) are coded here

Example

```
Update   Course  
Set      MaxStudents = 3  
Where    CourseID = 'DMIT1001';
```

Updates the Course table and sets the MaxStudents to 3 for CourseID DMIT1001.

Today's Objective

By the end of this section you will be able to:

- ❑ Write **DELETE** statements

Reminder: Quiz 3 (Create Table & DML Statements) will be next **Monday, October 27, 2025.**

Assignment 3 (TH : Create Table & DML Statements) is available on Brightspace and is **due Friday, October 31, 2025 at 5:00 PM.**

Delete

Delete

The Delete statement removes rows from a table. It does not act on individual columns as you can only delete a row and not a column.

Delete

Simplified Syntax:

```
DELETE [From] table_name  
[USING clause]  
[WHERE clause];
```

[From] - optional

- makes the statement more English-like

table_name - required

- identifies the table you want to delete rows from

USING clause - optional

- identifies additional table(s) referenced in the where clause that lets you delete rows in a table based on data in one or more other tables. If more than one table is included, tables are comma-delimited

WHERE clause- optional

- identifies which rows to delete from the table
- if not coded **ALL** rows are deleted if the Using clause is utilized, table join condition(s) are coded here

Example

Delete From Club;

Deletes all the records in the Club table.

Example

Delete From Club

Where ClubID = 'ACM';

Deletes a record where the Club ID is 'ACM'

Example

Delete From Payment

Where Amount < (Select AVG(Amount)
From Payment);

Deletes all the Payment records that are less than the average payment amount.

Activity

Please work on “Delete Exercises” found in the Activities section of “Week 7 – DML statements”. The questions are based on the IQSchool database.

Delete Exercises Solution

Question 1

-- 1. Delete all Activity records for all DMIT2590 students who have withdrawn.

Delete From Activity

Where StudentID In (Select StudentID

From Registration

Where CourseID = 'DMIT2590' And

WithdrawYN = 'Y');

Delete Exercises Solution

Question 2

-- 2. Delete all activities where students are no longer registered for any course.

Delete From Activity

Where StudentID Not In (Select StudentID
From Registration);

Delete Exercises Solution

Question 3

-- 3. Remove any Payment records made before 2001 with an amount less than \$500.

Delete From Payment

Where PaymentDate < '2001-01-01' And

Amount < 500.00;

Delete Exercises Solution

Question 4

-- 4. Remove all students who have no registrations and no outstanding balance.

Delete From Student

Where BalanceOwing = 0 And

StudentID Not In (Select StudentID

From Registration);

Delete Exercises Solution

Question 5

-- 5. Delete all students who have never made a payment, have no course registrations, and are not involved in any Activity.

Delete From Student

Where StudentID Not In (Select StudentID

From Payment) And

StudentID Not In (Select StudentID

From Registration) And

StudentID Not In (Select StudentID

From Activity);

Delete Exercises Solution

Question 6

-- 6. Delete all registrations where the student has withdrawn (i.e. WithdrawYN = 'Y').

Delete From Registration

Where WithdrawYN = 'Y';

Activity

Work on the Retroquest Summary Exercise found in the “Week 7 – DML Statements” section of Brightspace under Activities. The required files are “RetroQuest Summary Exercise 1.docx”, “RetroQuest_Starter.sql”, and Data.sql.

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